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(54) **FUEL FILLER LID ASSEMBLY**

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(52) **U.S. Cl.**
CPC ***B60K 15/05*** (2013.01); *B60K 2015/053* (2013.01)

(58) **Field of Classification Search**
CPC B60K 15/05; B60K 2015/53
USPC 296/97.22
See application file for complete search history.

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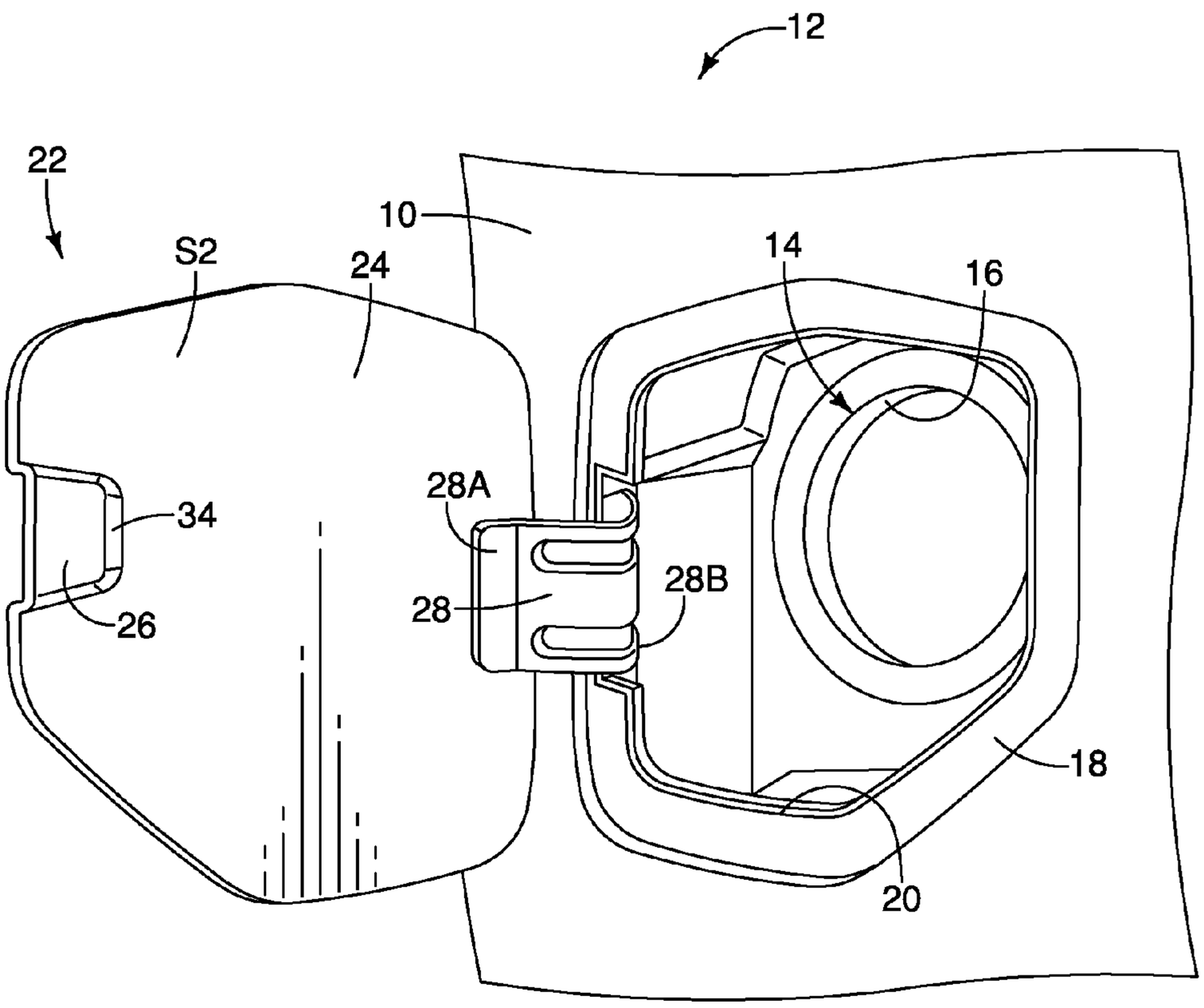
(57) **ABSTRACT**

A fuel filler lid assembly includes a fuel filler lid. The fuel filler lid configured to be supported to a vehicle body that has a fuel filler opening. The fuel filler lid has a first part that is movable with respect to the vehicle body between an open state and a closed state. The open state enables access to the fuel filler opening. The closed state encloses the fuel filler opening. The fuel filler lid has a second part that is indented with respect to the first part by a user operation surface. The user operation surface is accessed by a user to move the fuel filler lid between the open state and the closed state.

16 Claims, 3 Drawing Sheets



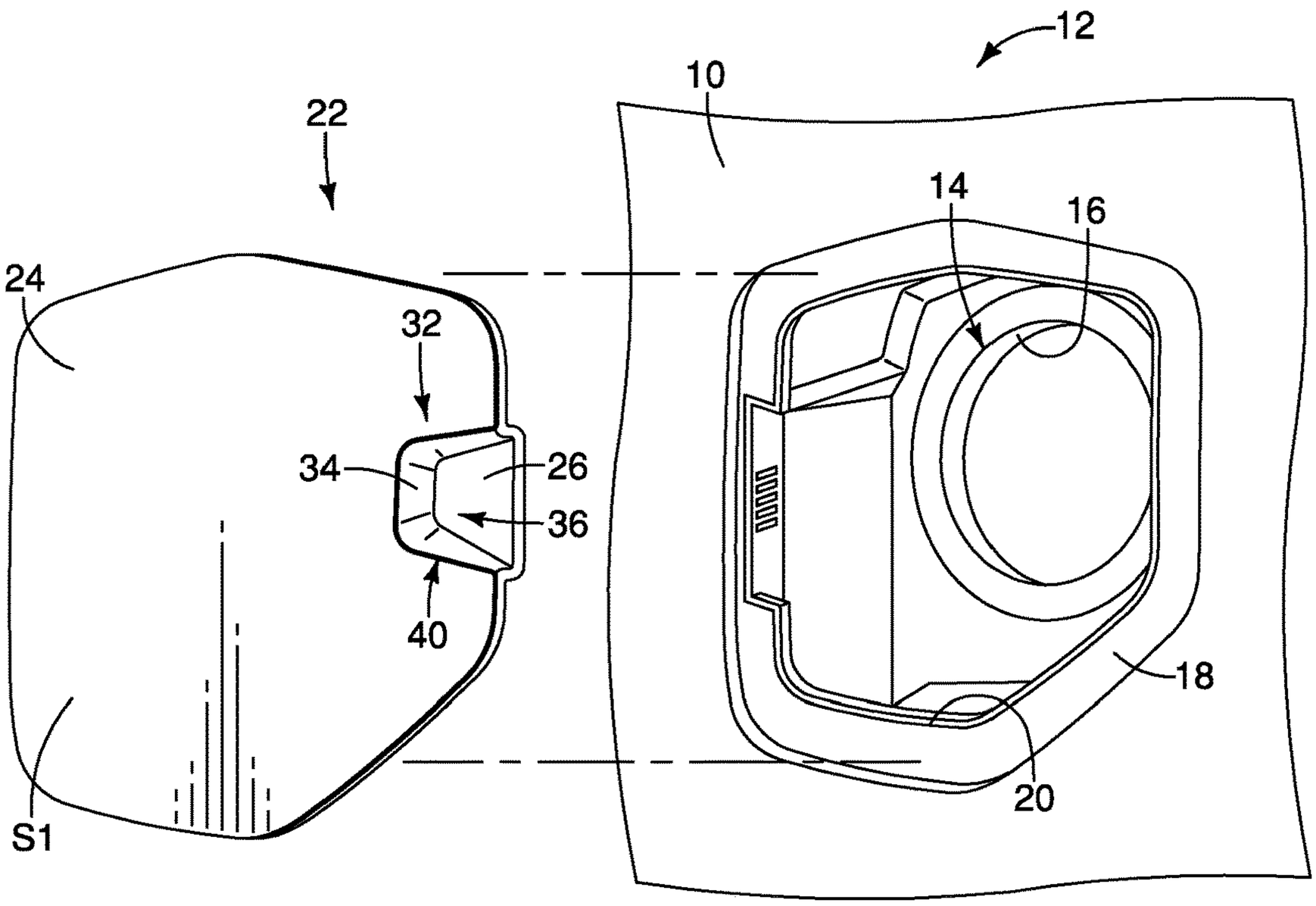

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FIG. 1

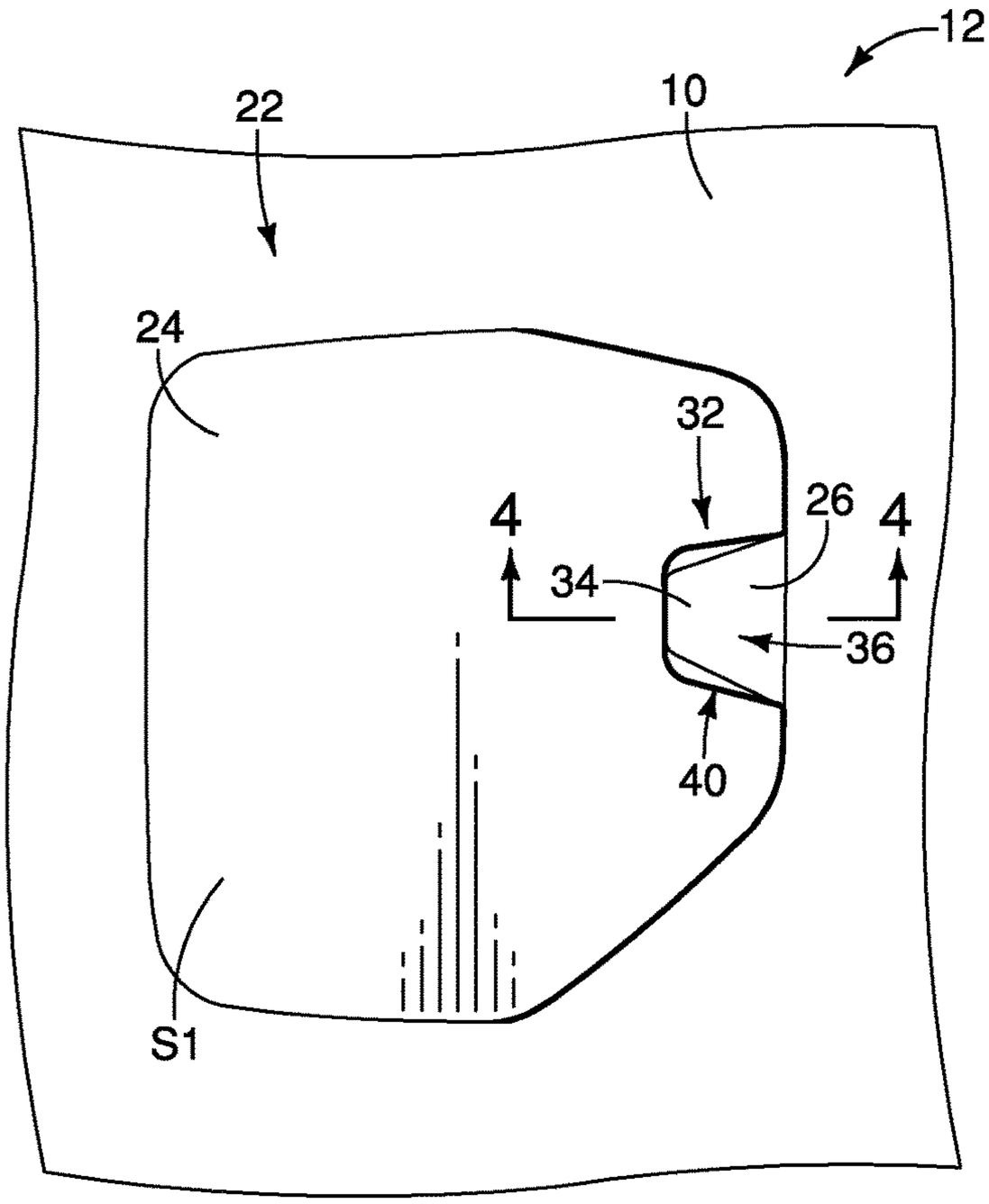
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FIG. 2

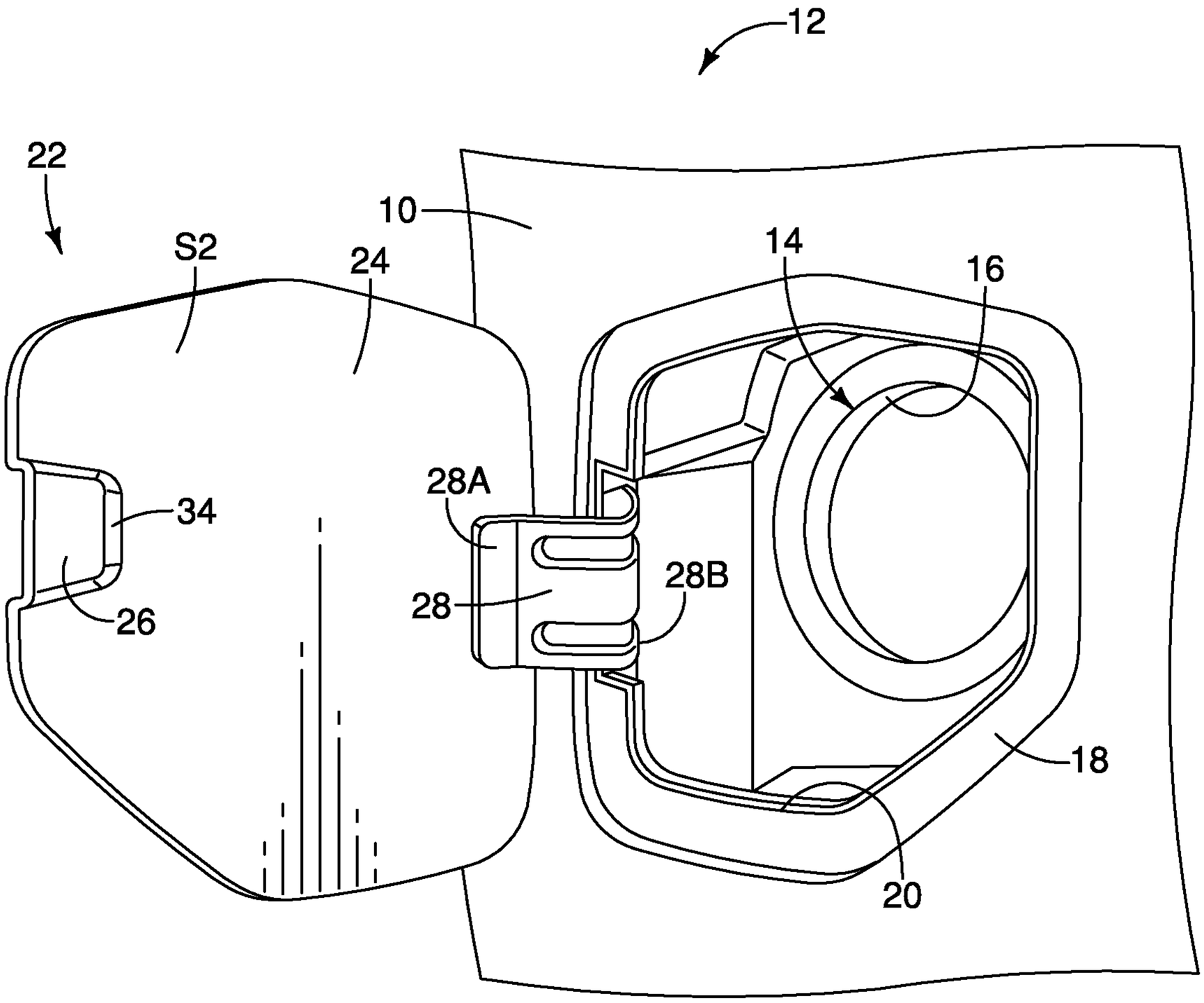

FIG. 3

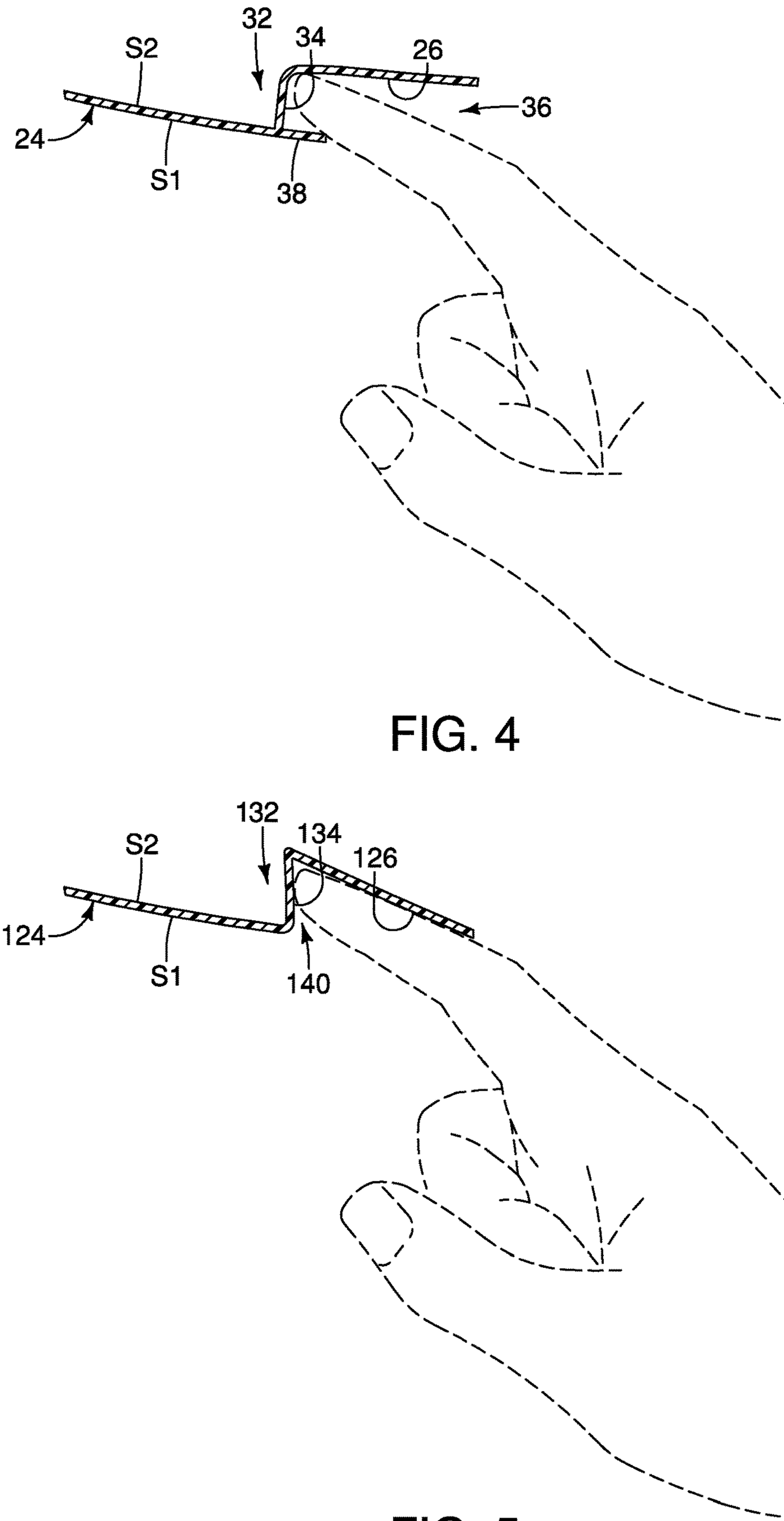

FIG. 4

FIG. 5

FUEL FILLER LID ASSEMBLY

BACKGROUND

Field of the Invention

The present invention generally relates to fuel filler lid assembly. More specifically, the present invention relates to fuel filler lid assembly for enclosing a fuel nozzle opening.

Background Information

Vehicles are equipped with fuel filler openings that lead to filler pipes in communication with a fuel tank of the vehicle to enable filling the vehicle with fuel. Vehicles can be equipped with fuel filler lids to enable access to the fuel filler openings or enclose the fuel filler openings.

SUMMARY

In view of the state of the known technology, one aspect of the present disclosure is to provide a fuel filler lid assembly comprising a fuel filler lid. The fuel filler lid configured to be supported to a vehicle body that has a fuel filler opening. The fuel filler lid has a first part that is movable with respect to the vehicle body between an open state and a closed state. The open state enables access to the fuel filler opening. The closed state encloses the fuel filler opening. The fuel filler lid has a second part that is indented with respect to the first part by a user operation surface. The user operation surface is accessed by a user to move the fuel filler lid between the open state and the closed state.

In view of the state of the known technology, another aspect of the present disclosure is to provide a vehicle comprising a vehicle body and a fuel filler lid. The vehicle body has a fuel filler opening. The fuel filler lid is supported to the vehicle body. The fuel filler lid has a first part that is movable with respect to the vehicle body between an open state and a closed state. The open state enables access to the fuel filler opening. The closed state covers the fuel filler opening. The fuel filler lid has a second part that is indented with respect to the first part by a user operation surface. The user operation surface is accessed by a user to move the fuel filler lid between the open state and the closed state.

BRIEF DESCRIPTION OF THE DRAWINGS

Referring now to the attached drawings which form a part of this original disclosure:

FIG. **1** is an exploded view of a fuel filler lid assembly in accordance with an illustrated embodiment;

FIG. **2** is a plan view of the fuel filler lid assembly of FIG. **1** having a fuel filler lid in a closed state;

FIG. **3** is a perspective view of the fuel filler lid assembly of FIGS. **2** and **3** having a fuel filler lid in an opened state;

FIG. **4** is a cross-sectional view of the fuel filler lid assembly taken along lines **4-4** in FIG. **3**; and

FIG. **5** is a cross-sectional view of a portion of a modified fuel lid assembly.

DETAILED DESCRIPTION OF EMBODIMENTS

Selected embodiments will now be explained with reference to the drawings. It will be apparent to those skilled in the art from this disclosure that the following descriptions of the embodiments are provided for illustration only and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.

Referring initially to FIG. **1**, a portion of a vehicle body **10** of a vehicle is illustrated as having a fuel filler lid assembly **12** in accordance with an illustrated embodiment. The vehicle body **10** includes a recess **14** that leads to a fuel filler opening **16**. The recess **14** is provided on a side surface of the vehicle and is recessed inwardly into the vehicle body **10**. Therefore, the vehicle body **10** has the fuel filler opening **16** that leads to a fuel tank (not shown) of the vehicle. The fuel filler opening **16** is shaped and designed for receiving a fuel nozzle (not shown) to fill the fuel tank.

As shown in FIG. **1**, the fuel filler lid assembly **12** preferably further comprises a fuel filler base **18** that is fixed to the vehicle body **10**. The fuel filler base **18** is a plastic trim that can be provided around a perimeter of the recess **14** and have an opening **20** can accommodate to the fuel filler opening **16** in order to accommodate the fuel nozzle therethrough. It will be apparent to those skilled in the vehicle field from this disclosure that the fuel filler base **18** can alternatively be disposed in the recess **14**. Therefore, the fuel filler base **18** can have a shape and contouring that corresponds to the shape and contouring of the recess **14**. It will be apparent to those skilled in the vehicle field from this disclosure that the fuel filler base **18** is optional and that the fuel filler lid **22** can be provided to a vehicle without the fuel filler base **18**.

The fuel filler lid assembly **12** comprises a fuel filler lid **22** that is configured to be supported to the vehicle body **10**. In the illustrated embodiment, the fuel filler lid **22** has a first part **24** and a second part **26**. The first and second parts **24** and **26** are preferably rigid components made of plastic. In the illustrated embodiment, the first part **24** is a main body of the fuel filler lid **22** that is movable with respect to the vehicle body **10** between an open state and a closed state. The first part **24** is open in the opened state to enable access to the fuel filler opening **16** as shown in FIG. **3**. The first part **24** is in the closed state to enclose the fuel filler opening **16** as seen in FIG. **2**.

In the illustrated embodiment, the second part **26** is movable with respect to the first part **24** as the first part **24** moves between the open state and the closed state, as will be further described below. Also in the illustrated embodiment, the first and second parts **24** and **26** of the fuel filler lid **22** has a color that is the same as a color of the vehicle body **10**. Therefore, the fuel filler lid assembly **12** is preferably designed such that the fuel filler lid **22** appears visually consistent with the vehicle body **10**.

As shown in FIG. **3**, the fuel filler lid **22** is supported to the vehicle body **10**. In particular, the fuel filler lid **22** is movably attached to the recess **14** of the vehicle body **10** via a hinge **28**. Therefore, the fuel filler lid **22** includes the hinge **28** that enables the fuel filler lid **22** to move with respect to the vehicle body **10**. Alternatively speaking, the first part **24** is hingedly or swingably supported with respect to the vehicle body **10** between the open and closed states. The fuel filler lid **22** can be movably mounted to the vehicle body **10** directly such as at the recess **14**, as shown. Alternatively, it will be apparent to those skilled in the vehicle field from this disclosure that the fuel filler lid **22** can be movably mounted to the fuel filler base **18** in a conventional manner. In particular, the first part **24** is swingably attached to the vehicle body **10** by the hinge **28**.

The first part **24** includes an exterior facing side S**1** (as shown in FIGS. **1** and **2**) and an inboard facing side S**2** (as shown in FIG. **3**). The hinge **28** is positioned on the inboard facing side S**2** of the first part **24**. The hinge **28** has a first end

28A that is attached to the inboard facing side S2 of the first part **24** and a second end **28**B that is attached to the recess **14** or to the fuel filler base **18** in a conventional manner. Preferably, the hinge **28** is biased so that the first part **24** is biased into the closed state.

As shown in FIG. **2**, in that closed state, first part **24** extends substantially in the same plane with the outer surface of the vehicle body **10**. That is, the first part **24** is positioned within the recess **14** so that the first part **24** is at least substantially flush with respect to the vehicle body **10** when the first part **24** is in the closed state. The fuel filler lid **22** has an overall shape that substantially corresponds to an overall shape of the recess **14**. More specifically, the first and second parts **24** and **26** together preferably have an overall shape that substantially covers the recess **14** and the fuel filler base **18** when the fuel filler lid **22** is in the closed state.

In the illustrated embodiment, the aperture **32** is a cutout at a side portion of the first part **24**. In particular, the aperture **32** is a cutout on the side portion that is opposite of a side portion of the first part **24** that has the hinge **28**. Alternatively speaking, the aperture **32** is located on a side edge of the first part **24**. It will be apparent to those skilled in the vehicle field from this disclosure that the first part **24** can include alternative or additional cutout(s) that is/are positioned on other parts of the fuel filler lid assembly **12**, such as on a top or bottom portion of the first part **24**. It will be apparent to those skilled in the vehicle field from this disclosure that the fuel filler lid **22** can include additional part(s) similar to the second part **26** that corresponds to any additional cutout(s).

In the illustrated embodiment, the second part **26** of the fuel filler lid is integrally attached to the first part **24** so that the second part **26** is disposed within the aperture **32**. In particular, the first and second parts **24** and **26** are initially separately formed and later bonded to each other. That is, the first part **24** is formed as having the aperture **32** that is a cutout on the side edge of the first part **24**. Therefore, the aperture **32** of the first part **24** has a shape that substantially corresponds to a shape of the second part **26** so that the second part **26** is fixed to the aperture **32** to basically enclose the aperture **32**. It will be apparent to those skilled in the vehicle field from this disclosure that the shape of the aperture **32** and the second part **26** can vary from the aperture **32** and the second part **26** illustrated herein as needed and/or desired.

In particular, in the illustrated embodiment, the first and second parts **24** and **26** are bonded by non-mechanical bonding (e.g., not using fasteners or mechanical components). The first and second parts **24** and **26** are then attached so that the second part **26** is fitted into the aperture **32**. Therefore, the second part **26** of the fuel filler lid **22** is integrally attached to the first part **24** so that the second part **26** is disposed within the aperture **32**.

For example, the first and second parts **24** and **26** can be bonded by conventional methods of plastic bonding, such as using adhesives including cyanoacrylate adhesives, UV curable adhesives, methyl methacrylate adhesives, as well as some epoxy and structural adhesives. Alternatively, the first and second parts **24** and **26** can be bonded by plastic welding using pressing, heating, and cooling of the first and second parts **24** and **26**. Additionally, bonding methods such as plastic welding, contact welding and/or heat sealing can be used to bond the first and second parts **24** and **26** together.

As best seen in FIGS. **1** and **3**, the second part **26** extends from the first part **24** in a direction towards the fuel filler opening **16** so that the second part **26** is closer to the fuel filler opening **16** than the first part **24** is to the fuel filler opening **16**. In particular, the second part **26** is disposed closer the recess **14** than the first part **24** is to the recess **14**. Therefore, the second part **26** is indented with respect to the first part **24** when the first part **24** is in both open state and the closed state. Alternatively speaking, the second part **26** is depressed with respect to the main body when the main body is in the open and closed position. That is the second part **26** is not flush or not on the same plane as the vehicle body **10**.

As best seen in FIG. **4**, the first and second parts **24** and **26** are integrally attached by a connecting surface **34**. In particular, the first and second parts **24** and **26** are connected to each other by the connecting surface **34**. The connecting surface **34** extends from the first part **24** to the second part **26** in a direction towards the recess **14** when the first part **24** is in the closed state. The fuel filler lid **22** has a pocket **36** formed by the connection of the second part **26**, the connecting surface **34** and a protruding portion **38** of the first part **24**. The protruding portion **38** protrudes from a main body of the first part **24** to overlap slightly with second part **26** as seen from a cross-sectional view taken along line **4-4** in FIG. **2**, which is shown in FIG. **4**. The pocket **36** of the first part **24** serves as a user operation portion **40** of the fuel filler lid **22**. That is, a user can access the user operation portion **40** to pull the first part **24** from the closed position to the open position. As shown in FIG. **2**, the pocket **36** is hidden from an outside lateral view of the fuel filler lid **22** when in the closed state over the fuel filler opening **20**. That is, the pocket **36** is not seen from the outside lateral view, such as the view illustrated in FIG. **2**. In the illustrated embodiment, the aperture **32** is defined by the pocket **36**.

Referring now to FIG. **5**, a portion of a modified fuel filler lid assembly **112** that can be implemented with the vehicle body **10** of the first illustrated embodiment is illustrated. That is, the modified fuel filler lid assembly **12** can replace the fuel filler assembly **12** of the first illustrated embodiment. The modified fuel filler lid assembly **112** comprises a modified fuel filler lid **122** that is configured to be supported to the vehicle body **10**. In the illustrated embodiment, the modified fuel filler lid **122** has a modified first part **124** and a modified second part **126**. Due to the similarities between the modified fuel filler lid assembly **112** and the fuel filler lid assembly **12**, all of the components of the modified fuel filler lid assembly **112** that are identical to the components of the fuel filler lid assembly **12** will receive the same reference numerals. All of the modified components that correspond to the components of the fuel filler lid assembly **12** will receive the same reference numerals but increased by 100.

The modified fuel filler lid assembly **112** is basically identical to the fuel filler lid assembly **12** except that the modified first part **124** of the fuel filler lid **122** has a modified aperture **132**. In particular, the modified aperture **132** is no longer defined by a pocket **36**. Therefore, the modified aperture **132** does not have the protruding portion **38**. Rather, the modified first part **124** and the modified second part **126** are connected by a connecting surface **134** that is itself a user operation portion **140**. Therefore, the first and second parts **124** and **126** are connected by the user operation portion **140**. The user operation portion **140** is accessed by a user to move the fuel filler lid **122** between the open state and the closed state.

Therefore, in the modified fuel filler lid assembly **112**, the arrangement of the first part **24** with respect to the second part **26** enables the aperture **132** of the first part **124** to function as a user operation portion **138** in which a user accesses the first part **124** to move the first part **124** with respect to the second part **126**. In this way, the second part

126 is accessed by the user to move the fuel filler lid **122** between the open state and the closed state.

General Interpretation of Terms

In understanding the scope of the present invention, the term "comprising" and its derivatives, as used herein, are intended to be open ended terms that specify the presence of the stated features, elements, components and/or groups but do not exclude the presence of other unstated features, elements, components and/or groups. The foregoing also applies to words having similar meanings such as the terms, "including", "having" and their derivatives. Also, the terms "part," "section," "portion," "member" or "element" when used in the singular can have the dual meaning of a single part or a plurality of parts. Also as used herein to describe the above embodiment(s), the following directional terms "forward", "rearward", "above", "downward", "vertical", "horizontal", "below" and "transverse" as well as any other similar directional terms refer to those directions of a vehicle equipped with the fuel filler lid assembly. Accordingly, these terms, as utilized to describe the present invention should be interpreted relative to a vehicle equipped with the fuel filler lid assembly.

The term "configured" as used herein to describe a component, section or part of a device that is constructed to carry out the desired function.

The terms of degree such as "substantially", "about" and "approximately" as used herein mean a reasonable amount of deviation of the modified term such that the end result is not significantly changed.

While only selected embodiments have been chosen to illustrate the present invention, it will be apparent to those skilled in the art from this disclosure that various changes and modifications can be made herein without departing from the scope of the invention as defined in the appended claims. For example, the size, shape, location or orientation of the various components can be changed as needed and/or desired. Components that are shown directly connected or contacting each other can have intermediate structures disposed between them. The functions of one element can be performed by two, and vice versa. The structures and functions of one embodiment can be adopted in another embodiment. It is not necessary for all advantages to be present in a particular embodiment at the same time. Every feature which is unique from the prior art, alone or in combination with other features, also should be considered a separate description of further inventions by the applicant, including the structural and/or functional concepts embodied by such feature(s). Thus, the foregoing descriptions of the embodiments according to the present invention are provided for illustration only, and not for the purpose of limiting the invention as defined by the appended claims and their equivalents.

What is claimed is:

1. A fuel filler lid assembly comprising:

a fuel filler lid configured to be supported to a vehicle body that has a fuel filler opening, the fuel filler lid having a first part that is movable with respect to the vehicle body between an open state to enable access to the fuel filler opening and a closed state to enclose the fuel filler opening, the fuel filler lid having a second part that is indented with respect to the first part by a user operation surface that is accessed by a user to move the fuel filler lid between the open state and the closed state, the first and second parts being integrally attached by the user operation surface.

2. The fuel filler lid assembly according to claim **1**, wherein

the first part of the fuel filler lid having an aperture, the second part of the fuel filler lid being integrally attached to the first part so that the second part is disposed within the aperture.

3. The fuel filler lid assembly according to claim **2**, wherein

the aperture of the first part having a shape that corresponds to a shape of the second part.

4. The fuel filler lid assembly according to claim **3**, wherein

the aperture is a cutout of a side portion of the first part.

5. The fuel filler lid assembly according to claim **1**, wherein

the second part extends from the first part in a direction towards the vehicle body so that the second part is closer to the vehicle body than the first part is to the vehicle body.

6. The fuel filler lid assembly according to claim **1**, further comprising

a fuel filler base that is fixed to the vehicle body and having an opening that accommodates the fuel filler opening, the fuel filler lid being pivotally attached to the fuel filler base.

7. A fuel filler lid assembly comprising:

a fuel filler lid configured to be supported to a vehicle body that has a fuel filler opening, the fuel filler lid having a first part that is movable with respect to the vehicle body between an open state to enable access to the fuel filler opening and a closed state to enclose the fuel filler opening, the fuel filler lid having a second part that is indented with respect to the first part by a user operation surface that is accessed by a user to move the fuel filler lid between the open state and the closed state, the fuel filler lid having a pocket formed by the connection of the second part, the user operation surface and a portion of the first part.

8. The fuel filler lid assembly according to claim **7**, wherein

the pocket is hidden from an outside lateral view of the fuel filler lid when in the closed state over the fuel filler opening.

9. A vehicle comprising:

a vehicle body having a fuel filler opening; and

a fuel filler lid supported to the vehicle body, the fuel filler lid having a first part that is movable with respect to the vehicle body between an open state to enable access to the fuel filler opening and a closed state to cover the fuel filler opening, the fuel filler lid having a second part that is indented with respect to the first part by a user operation surface that is accessed by a user to move the fuel filler lid between the open state and the closed state, the first and second parts are integrally attached by the user operation surface.

10. The fuel filler lid assembly according to claim **9**, wherein

the first part of the fuel filler lid having an aperture, the second part of the fuel filler lid being integrally attached to the first part so that the second part is disposed within the aperture.

11. The fuel filler lid assembly according to claim **10**, wherein

the aperture of the first part having a shape that corresponds to a shape of the second part.

12. The fuel filler lid assembly according to claim **11**, wherein

the aperture is on a side edge of the first part.

13. The fuel filler lid assembly according to claim **9**, wherein

the second part extends from the first part in a direction towards the fuel filler opening so that the second part is closer to the fuel filler opening than the first part is to the vehicle filler opening.

14. The fuel filler lid assembly according to claim **9**, further comprising

a fuel filler base that is fixed to the vehicle body and having an opening that corresponds to the fuel filler opening, the fuel filler lid being pivotally attached to the fuel filler base.

15. The fuel filler lid assembly according to claim **9**, further comprising

a fuel filler base that is fixed to the vehicle body and having an opening that corresponds to the fuel filler opening, the fuel filler lid being pivotally attached to the fuel filler base.

16. A fuel filler lid assembly, comprising:

a vehicle body having a fuel filler opening; and

a fuel filler lid supported to the vehicle body, the fuel filler lid having a first part that is movable with respect to the vehicle body between an open state to enable access to the fuel filler opening and a closed state to cover the fuel filler opening, the fuel filler lid having a second part that is indented with respect to the first part by a user operation surface that is accessed by a user to move the fuel filler lid between the open state and the closed state, the fuel filler lid having a pocket formed by the connection of the second part, the user operation surface and a portion of the first part.

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